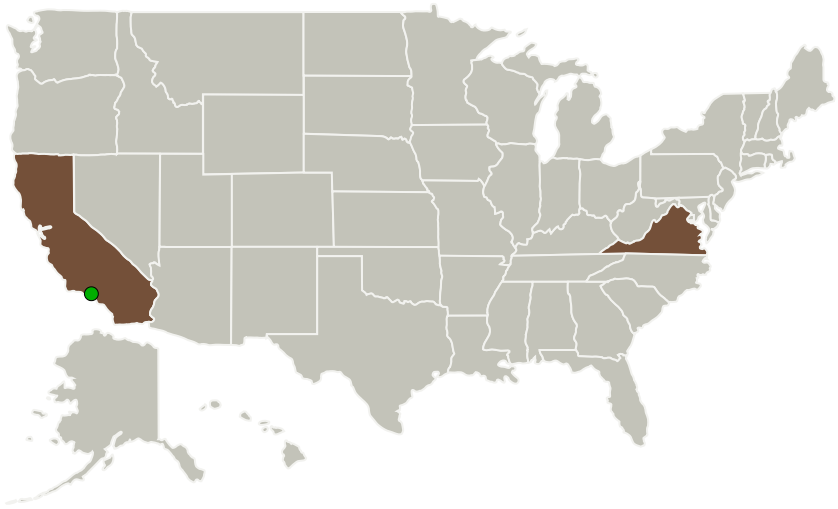
Improved Rock Core Sample Break-off, Retention and Ejection System, Phase II

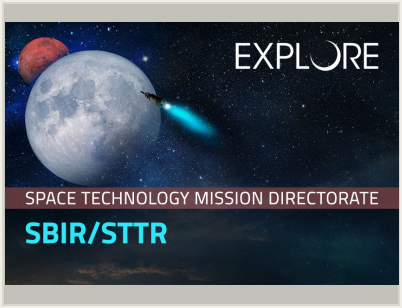
Completed Technology Project (2010 - 2012)

Project Introduction

The proposed effort advances the design of an innovative core sampling and acquisition system with improved core break-off, retention and ejection features. Phase 1 successfully demonstrated, at TRL 4, the ability of the system to acquire rock core samples that are 10 mm diameter and 100 mm long. The proposed innovation employs a different drill tube design in the vicinity of the core that does not impose any loads on the core and does not rotate relative to the core. This novel technique actually envelopes and protects the core as it is generated. The benefits are two fold; first, the integrity of the core is maintained and second, core ejection is much easier which greatly reduces, if not eliminates the risk of the core jamming within the drill tube/bit. These improvements can be obtained without increasing the annulus of the drill bit that would otherwise require more down force, torque, power and bit wear. By the end of the proposed Phase 2 effort, a prototype design of the improved coring system will be tested at TRL 6 with Mars ambient conditions.

Primary U.S. Work Locations and Key Partners





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Organizations Performing Work	Role	Type	Location
Bear Technologies, LLC	Lead Organization	Industry Small Disadvantaged Business (SDB)	Oilville, Virginia
Jet Propulsion Laboratory(JPL)	Supporting Organization	NASA Center	Pasadena, California

Primary U.S. Work Locations	
California	Virginia

Project Transitions

March 2010: Project Start

June 2012: Closed out

Closeout Documentation:

- Final Summary Chart*(https://techport.nasa.gov/file/139100)*

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Organization:

Bear Technologies, LLC

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:

Jason L Kessler

Program Manager:

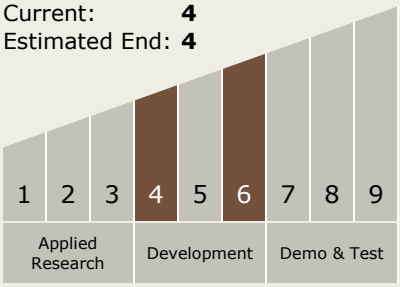
Carlos Torrez

Principal Investigator:

Tom Myrick

Technology Maturity (TRL)

Start: **6**
Current: **4**
Estimated End: **4**



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Technology Areas

Primary:

- TX04 Robotic Systems
  - TX04.3 Manipulation
    - TX04.3.2 Grappling Technologies

Target Destinations

The Sun, Earth, The Moon, Mars, Others Inside the Solar System, Outside the Solar System